WDFW Intertidal Forage Fish Spawning Habitat Survey Protocols

Laboratory procedure for determining forage fish egg presence/absence from preserved "winnowed light fraction" beach substrate samples

---

Laboratory materials needed:

Fume hood (alternatively, winnowed light fraction samples can be carefully washed before analysis)*
Latex or nitrile gloves*
Spoon
Oval microscope dish
Dissecting microscope with 10-20x power
Watchglasses/small Petri dishes
Fine-point (watchmakers) forceps
Data/tally sheets
Paper towels
Buckets/pans/sample jars (to collect waste, accumulated samples, etc.)

*Depending on the preservative used, samples may be toxic or carcinogenic. Take proper precautions.

Note*:* This procedure describes a second reduction of bulk substrate material collected during field sampling and is best used for determining spawn presence/absence. If detailed egg stage counts are needed, use the associated document "Laboratory procedure for counting and staging forage fish eggs."

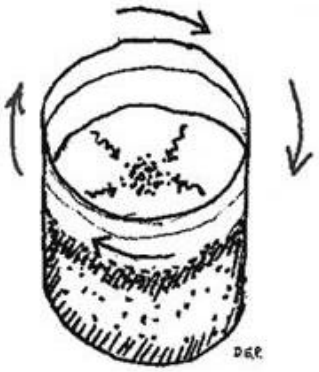
Procedure:

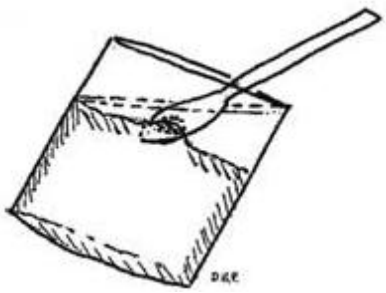
1. Stir "winnowed light fraction" sample jar contents with spoon.

2. Swirl jar in clockwise manner to impart rotation to fluid and surface layer of contents, causing light material to move to center of jar.

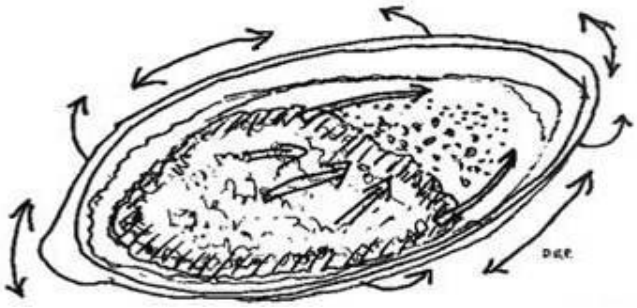
3. Carefully tilt jar. Slowly scoop center mound of light material with spoon into oval microscope dish.

4. Repeat steps 1-3 four times, accumulating about 400 grams of light material in microscope dish.

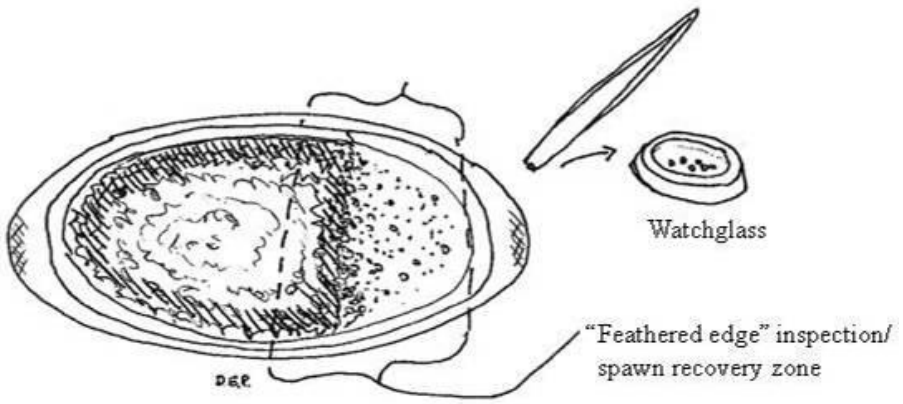




5. Add water to microscope dish. Swirl/tilt/yaw dish to suspend lightest material and concentrate it along feathered edge of the deposit in the dish.



6. Place dish on microscope stage. Inspect zone around feathered edge of deposit. Remove eggs to watchglass with forceps.



7. Reverse dish to redistribute sediment. Repeat steps 5+6 three more times, or until eggs cease to be detected around feathered edge of deposit. Species assignment may be made at this time or after completing processing (see attached egg identification guide).

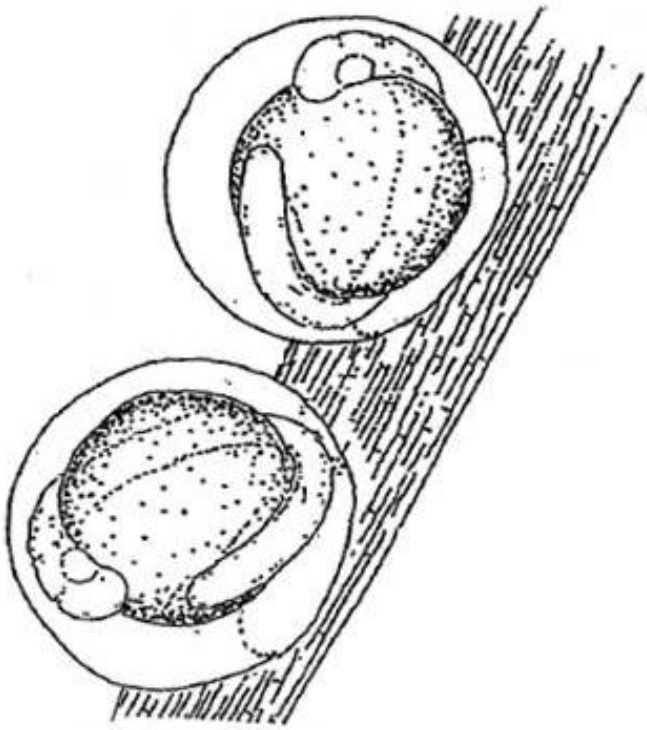
8. If steps 1-7 produce zero eggs, or only a single egg, repeat the procedure with a second sample of material from the same jar of "winnowed light fraction." The WDFW standard for documenting a spawning site for a given species is 2 eggs in a single "winnowed light fraction" sample.

9. Either preserve eggs for future counting and staging, or identify eggs in watchglass (see attached egg identification guide) to determine the species present.

10. Complete survey findings, as well as preserved egg samples if taken, should be sent to Dayv Lowry at Dayv.Lowry@dfw.wa.gov and/or WDFW, Habitat Program, 1111 Washington St SE, Olympia, WA 98501.

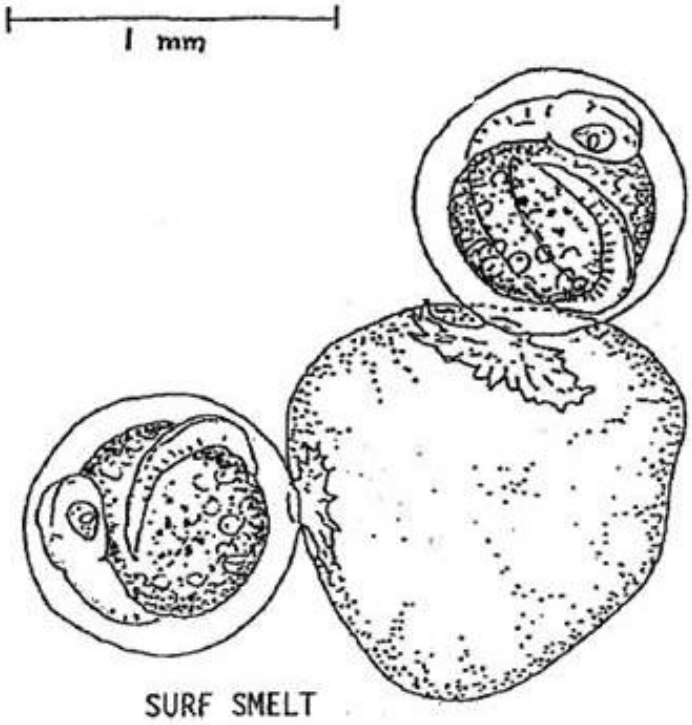
Original protocol by Dan Penttila, WDFW. Reformatted by Dayv Lowry, WDFW.

Forage Fish Eggs of Puget Sound



PACIFIC HERRING

almost entirely deposited on marine vegetation; distinct shell attachment sites; self-adhesive in layers or clumps.

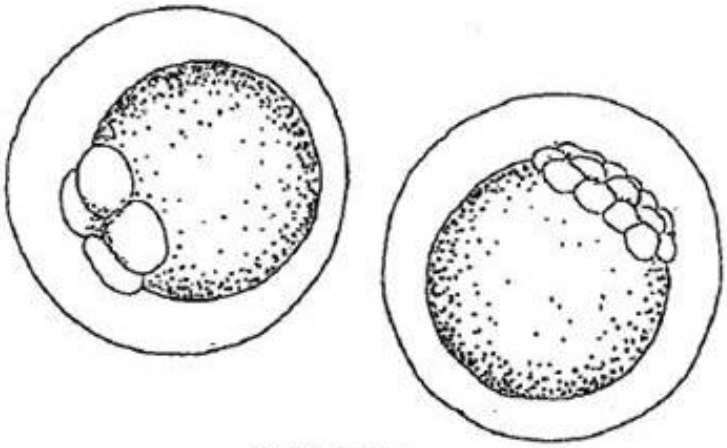


SURF SMELT

single pedestal-like attachment site; non-self-adhesive; entirely in beach sediment particles.

PACIFIC SAND LANCE

relatively small; multiple sand grain attachment sites; egg off-round/milky; 1 large oil droplet in yolk.



ROCK SOLE

egg perfectly spherical; very clear; no visible attachment sites; non-self-adhesive.

D.E.P.